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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,759	02/13/2004	Yi-Tsuo Wu	3313-1113P	5326
2292	7590	04/21/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			MULPURI, SAVITRI	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

119

Office Action Summary	Application No.	Applicant(s)	
	10/777,759	WU ET AL.	
	Examiner	Art Unit	
	Savitri Mulpuri	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 6-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 12-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/13/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to the election of process claim 1-5, 12-17, received on 1/30/2006.

Claim Rejections - 35 USC § 112

Claims 1-5, 12-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, 12 the word "heavily doped" is indefinite in scope because there is neither recitation of dopant concentration nor the recitation of relative dopant concentration with respect to the adjacent layers.

In claim 5 the dopants in the heavily doped layer is silicon and it should not be silicon because Si gives n-type because the dopants ohmic contact channel is p-type and the dopants in heavily doped layer is p-type because they are connected and eventually connected p-type electrode.

In claim 16 it is not clear which heavily doped layer doped with Si. And it is appropriate to add "bottom" before heavily doped.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 12-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Jewell et al(US 5,245,622).

Jewell et al teaches a method of making VCSEL used to form a contact electrode on a surface –emitting laser structure a resonance cavity , comprising forming a heavily doped layer adjacent to Bragg reflector in the resonance cavity , wherein the light intensity is the weakest , the process being characterized in that : the Bragg reflector is etched, the distance between the etching stop layer an the surface of the heavily doped layer being smaller than a predetermined diffusion depth of the dopants to be injected subsequently ,and the dopants being doped and diffusing into predetermined region of the conductive electrode to from a high carrier concentration ohmic contact channel connecting the heavily doped layer , thereby the conductive electrode being formed on the predetermined region , and the electrical property of the do pants is same as the heavily doped layer. In view of the of the claimed limitation of “heavily doped layer” Jewell et al teaches the process similar to instant claimed process because the layer “63” in Jewell can be considered as heavily doped layer and p-doped region “65” formed implantation followed by diffusion is considered as high-carrier concentration ohmic contact channel which is eventually connected to p-type upper electrode “80” with reduced contact resistance due to heavily doped p-type region “65”.(see fig 5 and related description, col. 7, lines 53-67). Jewell et al also discloses in another embodiment etching the upper Bragg reflector to form mesa and the forming metal electrode ‘260” on the etched portion (see fig. 9-11).

Claim17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Prior art neither teach nor suggest the process of making VCSEL further comprising a bottom high-carrier concentration ohmic contact channel via which the lower electrode connects to the bottom heavily doped layer.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 571-272-1677. The examiner can normally be reached on Mon-Fri from 8 a.m. to 4.30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt, can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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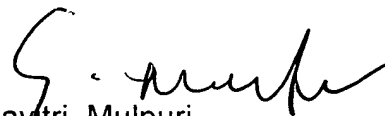
published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



Savitri Mulpuri
Primary Examiner
Art Unit 2812